

Listing of Claims:

1. (Previously Presented) A scanner, comprising:
a housing;
a transparent platen atop the housing for receiving an object to be scanned;
a carriage operable to travel along a first direction and a second direction,
wherein the first and second directions are not co-linear and are within a plane that is substantially parallel to the transparent platen, the carriage comprising:
a light source for illuminating the object; and
a rectangular photodetector array for simultaneously detecting light intensity of multiple scan lines, the rectangular photodetector array comprising more than three rows of photodetectors.
2. (Original) The scanner of claim 1, wherein the carriage further comprises:
a mounting plate having a horizontal guide, the light source and the rectangular photodetector array being mounted on the mounting plate;
a first motor linked to a first gear; and
a horizontal carriage bar defining a horizontal guide channel for receiving the horizontal guide and a horizontal gear channel for receiving the first gear, the first motor being operable to drive the first gear to move the carriage along the horizontal direction.
3. (Original) The scanner of claim 2, wherein:
the horizontal carriage bar has vertical guides;
the carriage further comprises a second motor linked to a second gear; and
the housing defines vertical guide channels for receiving the vertical guides and a vertical gear channel for receiving the second gear, the second motor being operable to drive the second gear to move the carriage along the vertical direction.
4. (Original) The scanner of claim 1, wherein the light source comprises a ring of light emitting diodes formed around the rectangular photodetector array.

5. (Original) The scanner of claim 1, wherein the rectangular photodetector array comprises a complementary metal oxide semiconductor (CMOS) image sensor array.

6. (Previously Presented) The scanner of claim 5, wherein the light source comprises light emitting diodes located on a die, and the rectangular photodetector array is also located on the die.

7. (Withdrawn) A method for operating a scanner, comprising:
capturing a first image of an object placed on a transparent platen of the scanner with a rectangular photodetector array, the rectangular photodetector array comprising more than three rows of photodetectors;

moving the rectangular photodetector array in a first small increment along a first direction and a second small increment along a second direction, the first increment being less than a first spacing between adjacent photodetectors on the photodetector array along the first direction, the second increment being less than a second spacing between adjacent photodetectors on the photodetector array along the second direction; and

capturing a second image of the object.

8. (Withdrawn) The method of claim 7, further comprising combining the first and the second image to form a scanned image of the object.

9. (Withdrawn) The method of claim 7, further comprising:
moving the rectangular photodetector array in a large increment along the first direction; and

capturing a third image of the object.

10. (Withdrawn) The method of claim 9, wherein the large increment is at least a dimension of the rectangular photodetector array along the first direction.

11. (Withdrawn) The method of claim 9, further comprising:
moving the rectangular photodetector array in the first small increment along the first direction and the second small increment along the second direction; and

capturing a fourth image of the object.

12. (Withdrawn) The method of claim 11, further comprising combining the first, the second, the third, and the fourth image to form a scanned image of the object.

13. (Withdrawn) A scanner, comprising:
a housing;
feed rollers that move a document in a first direction;
a carriage operable to travel along a second direction, the carriage comprising:
a light source for illuminating the document; and
a rectangular photodetector array for simultaneously detecting light intensity of multiple scan lines, the rectangular photodetector array comprising more than three rows of photodetectors.

14. (Withdrawn) The scanner of claim 13, wherein the carriage further comprises:
a mounting plate having a horizontal guide, the light source and the rectangular photodetector array being mounted on the mounting plate;
a first motor linked to a first gear; and
a horizontal carriage bar defining a horizontal guide channel for receiving the horizontal guide and a horizontal gear channel for receiving the first gear, the first motor being operable to drive the first gear to move the carriage along the horizontal direction.

15. (Withdrawn) The scanner of claim 13, wherein the light source comprises a ring of light emitting diodes formed around the rectangular photodetector array.

16. (Withdrawn) The scanner of claim 13, wherein the rectangular photodetector array comprises a complementary metal oxide semiconductor (CMOS) photodetector array.

17. (Withdrawn) The scanner of claim 16, wherein the light source comprises light emitting diodes located on the same die as the rectangular photodetector array.

18. (Withdrawn) A scanner, comprising:
a housing;
a transparent platen atop the housing for receiving an object to be scanned;
a light source for illuminating the entire object;
optics for directing light reflecting off the entire object to a rectangular photodetector array; and

the rectangular photodetector array for simultaneously detecting light intensity of the entire object, the rectangular photodetector array comprising more than three rows of photodetectors.

19. (Previously Presented) A scanner, comprising:
a housing;
a transparent platen atop the housing for receiving an object to be scanned;
illumination means for illuminating the object;
light intensity detection means for simultaneously detecting light intensity of multiple scan lines; and

carriage means supporting the illumination means and the light intensity detection means for transporting the illumination means and light intensity detection means in a first direction and a second direction, wherein the first and second directions are not co-linear and are both within a plane that is substantially parallel to the transparent platen.

20. (Original) The scanner of claim 19, wherein the light intensity detection means comprises an array of photodetectors having at least three rows of photodetectors.

21. (Original) The scanner of claim 19, wherein the carriage means comprises:

a mounting plate having a horizontal guide, the illumination means and the light intensity detection means being mounted on the mounting plate;

a first drive means; and

a horizontal carriage bar defining a horizontal guide channel for receiving the horizontal guide, the first drive means being operable to drive a carriage along the horizontal direction.

22. (Original) The scanner of claim 21, further comprising:
vertical guides defined on the horizontal carriage bar;
a second drive means; and
vertical guide channels defined by the housing for receiving the vertical guides, the second drive means operable to drive the carriage along the vertical direction.

23. (Original) The scanner of claim 19, wherein the illumination means comprises a ring of light emitting diodes formed around a periphery of the light intensity detection means.

24. (Original) The scanner of claim 19, wherein the light intensity detection means comprises a complementary metal oxide semiconductor (CMOS) image sensor array.

25. (Original) The scanner of claim 24, wherein the light source comprises light emitting diodes located on a common die with a rectangular photodetector array.

26. (Withdrawn) A scanner, comprising:
a housing;
means for moving a document in a first direction;
illumination means for illuminating the document;
photodetection means for simultaneously detecting light intensity of multiple scan lines; and
carriage means for supporting the illumination means and photodetection means and moving the illumination means and photodetection means in a second direction.

27. (Withdrawn) The scanner of claim 26, wherein the carriage means comprises:
a mounting plate having a horizontal guide, the illumination means and the photodetection means being mounted on the mounting plate;
a drive means for driving a gear; and

a horizontal carriage bar defining a horizontal guide channel for receiving the horizontal guide and a horizontal gear channel for receiving the gear, the drive means operable to drive the gear to move the carriage means along the horizontal direction.

28. (Withdrawn) The scanner of claim 26, wherein the illumination means comprises a ring of light emitting diodes formed around the photodetection means.

29. (Withdrawn) The scanner of claim 26, wherein the photodetection means comprises a rectangular photodetector array having at least three rows of photodetectors.

30. (Withdrawn) The scanner of claim 29, wherein the rectangular photodetector array comprises a complementary metal oxide semiconductor (CMOS) photodetector array.

31. (Withdrawn) The scanner of claim 30, wherein the illumination means comprises light emitting diodes located on a common die with the rectangular photodetector array.

32. (Withdrawn) The scanner of claim 29 wherein the photodetector array defines a vertical resolution and a horizontal resolution, the photodetector array adapted to capture a first image of the document with the document and the carriage means in a first position, means for moving the document in the first direction a distance less than the vertical resolution of the photodetector array, and the carriage means adapted to move the illumination means and the photodetector array in the second direction a distance less than the horizontal resolution of the photodetector array to define a second position, the photodetector array adapted to capture a second image of the document with the document and the carriage means in the second position.

33. (Withdrawn) A method of scanning a document comprising:
feeding a document into the scanner;
capturing a first image of the document;
moving a photodetector array and a light source horizontally relative to the document;

moving the document vertically in an increment equal to or greater than a photodetector array height; and
capturing a second image of the document.

34. (Withdrawn) A scanner, comprising:
a housing;
a transparent platen atop the housing for receiving an object to be scanned;
means for illuminating the entire object;
means for directing light reflected from the entire object; and
means for detecting light, the light directing means adapted to direct the light reflected from the entire object onto the light detecting means, and the light detecting means adapted to simultaneously detect light intensity from the entire object.

35. (Withdrawn) A method of scanning an object comprising:
illuminating an entire object;
directing light reflected from the entire object onto a photodetector array;
and
simultaneously detecting intensity of light reflected from the entire object and directed onto the photodetector array.